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| 10/715,051 | 11/17/2003 | Dennis A. Kramer | 60,130-1899;03MRA0388 | 3671 |
| 26096 | 7590 | 11/22/2005 | EXAMINER | |
| CARLSON, GASKEY & OLDS, P.C. 400 WEST MAPLE ROAD SUITE 350 BIRMINGHAM, MI 48009 | | | BURCH, MELODY M | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3683 | |

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,051

Applicant(s)

KRAMER, DENNIS A.

Examiner

Melody M. Burch

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/8/05 & 9/16/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-14 and 21 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 15-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/15/05
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: element "X" added in the amendment filed 9/16/05. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as "Annotated Sheets" and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Information Disclosure Statement

3. The information disclosure statement filed 8/15/05 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. The abstract of the Japanese reference is not provided.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re: claim 21. The phrase "a braking force" in line 4 is indefinite. It is unclear to the Examiner whether this braking force is the same or different from the earlier recited braking force. A similar issue exists with the term "a clearance" in line 2 from the bottom. The phrase "components of the disc brake" in line 4 is indefinite. It is unclear whether the components in this claim are intended to be the same or different from the brake pad and the item to be braked earlier recited. Also, it is unclear whether there is intended to be a distinction between "a gap" in line 3 from the bottom and "a clearance" in line 2 from the bottom of the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4784244 to Carre et al.

Re: claim 1. Carre et al. show in figure 1 a disc brake 2 comprising an actuation mechanism 8,9 being movable to apply a braking force via intervening elements, a pair of pistons one shown at the end of the lead line of number 15 and the other shown surrounding element 29 movable upon receipt of the braking force to force a brake pad shown connected to element 4a into contact with an item to be braked, an adjustment mechanism 14,17 for adjusting the location of the pistons to take up clearance with wear in the brake pad, and a force sensor 23 for sensing a reaction force to the braking force, and identifying a point of force application increase indicative of initial contact of the brake pad with the item to be braked, the force sensor sending a signal to an electric control 24 for the adjustment mechanism.

Re: claim 21. Carre et al. show in figure 1 wherein the signal is utilized to identify the point of force application and the point of force application is associated with a rotational position of a portion of the actuation mechanism or the rotational position of wheel 14, the rotational position being utilized after application of a braking force (for example, after the first braking application) to identify a gap between components of

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the disc brake, to in turn identify a clearance that is adjusted by the adjustment mechanism after the application of the braking force via element 28 as disclosed in col. 3 lines 29-30.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carre et al. in view of US Patent 6272936 to Oreper et al.

Re: claims 7 and 10. Carre et al. describe the invention substantially as set forth above including the limitation of a force sensor, but fail to specifically disclose that the force sensor is an electric sensor receiving a current and having a resistance that varies with the force applied to the force sensor.

Oreper et al. teach the use of a force sensor that is an electric sensor receiving a current and having a resistance that varies with the force applied to the force sensor. See paragraph [0008] of the instant invention.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the force sensor of Carre et al. to have specifically been an electric sensor receiving a current and having a resistance that varies with the force applied to the force sensor, as taught by Oreper et al., in order to provide a sensor with optimum sensitivity.

Re: claims 8, 9, 11, and 12. Carre et al. describe the invention substantially a set forth above including the limitation of a force sensor, but fail to specifically disclose that the force sensor includes a protective cover between a member which applies the reaction force and an electric portion of the force sensor which receives current and also fail to disclose the limitation of a relatively thin anvil member placed between the protective cover and the electric portion.

Oreper et al. teach in figures 2 and 8 and in Applicant's admission in paragraph [0008] the limitation of the force sensor including a protective cover between a member which applies the reaction force and an electric portion of the force sensor which receives current and the limitation of a relatively thin anvil member placed between the protective cover and the electric portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of the force sensor of Carre et al. to have included a protective cover between the member which applies the reaction force and an electric portion of the force sensor and to have included a thin anvil member between the protective cover and the electric portion, as taught by Oreper et al., in order to provide a means of limiting the amount of force that can be transferred throughout the device to protect the sensor.

10. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6397977 to Ward in view of Carre et al.

Re: claim 1. Ward shows in figure 1 a disc brake 10 comprising an actuation

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mechanism described in col. 4 lines 24-28 being movable to apply a braking force via intervening elements, a pair of pistons 24,24 movable upon receipt of the braking force to force a brake pad 26 into contact with an item 1a to be braked, an adjustment mechanism 14,18 for adjusting the location of the pistons to take up clearance with wear in the brake pad, and the presence of a reaction force to the braking force as disclosed in col. 4 lines 40-44.

Ward fails to show the limitation of a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism.

Carre et al. teach in figure 1 the use of a disc brake comprising a force sensor 23 for sensing a reaction force to the braking force and identifying a point of force application increase indicative of initial contact of the brake pad with the item to be braked, the force sensor sending a signal to an electric control 24 for the adjustment mechanism 8 of the disc brake.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the disc brake of Ward to have included a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism, as taught by Carre et al., in order to provide more accurate adjustments of the adjustment mechanism for brake control purposes as suggested in Carre et al. col. 4 lines 20-21.

Re: claim 2. Ward, as modified, teaches in figure 1 of Ward the limitation wherein the actuation mechanism is an eccentric shaft 14,18 the eccentric shaft driving

at least one bearing 20 to in turn force the pistons and the brake pad toward the item to be braked.

Re: claim 3. Ward, as modified, describes the invention substantially as set forth above, but does not include the limitation wherein the force sensor is located to receive a reaction force from the eccentric shaft and the eccentric shaft applying the reaction force to the bearing.

Carre et al. teach in figure 1 the use of a force sensor 23 being located to receive a reaction force from a shaft 10,11 driving at least one rolling bearing 14 to force the pistons and the brake pad toward an item 1a to be braked.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned a force sensor such that it received a reaction force from the eccentric shaft of Ward, as modified, in view of the teachings of Carre et al., in order to provide a means of detecting the force transmitted by the piston structure on the friction member as taught by Carre et al. in col. 3 lines 15-18.

11. Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6397977 to Ward in view of Carre et al. and further in view of Oreper et al.

Re: claims 10-12. Ward shows in figure 1 a disc brake 10 comprising an actuation mechanism described in col. 4 lines 24-28 being movable to apply a braking force, a pair of pistons 24,24 movable upon receipt of the braking force to force a brake pad 26 into contact with an item 1a to be braked, an adjustment mechanism 18,14 for adjusting the location of the pistons to take up clearance with wear in the brake pad,

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and the presence of a reaction force to the braking force as disclosed in col. 4 lines 40-44.

Ward fails to show the limitation of a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism.

Carre et al. teach in figure 1 the use of a disc brake comprising a force sensor 23 for sensing a reaction force to the braking force and identifying a point of force application increase indicative of initial contact of the brake pad with the item to be braked, the force sensor sending a signal to an electric control 24 for the adjustment mechanism 8 of the disc brake.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the disc brake of Ward to have included a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism, as taught by Carre et al., in order to provide more accurate adjustments of the adjustment mechanism for brake control purposes as suggested in Carre et al. col. 4 lines 20-21.

Ward, as modified, is silent as to the makeup of the force sensor specifically being an electric sensor receiving a current and having a resistance that varies with the force applied to the sensor.

Oreper et al. teach in figures 2 and 8 and in Applicant's admission in paragraph [0008] the limitation of the force sensor including a protective cover between a member which applies the reaction force and an electric portion of the force sensor which

receives current and the limitation of a relatively thin anvil member placed between the protective cover and the electric portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of the force sensor of Ward, as modified, to have included a protective cover between the member which applies the reaction force and an electric portion of the force sensor and to have included a thin anvil member between the protective cover and the electric portion, as taught by Oreper et al., in order to provide a means of limiting the amount of force that can be transferred throughout the device to protect the sensor.

Re: claim 13. Ward, as modified, teaches in figure 1 of Ward the limitation wherein the actuation mechanism is an eccentric shaft 14,18 the eccentric shaft driving at least one bearing 20 to in turn force the pistons and the brake pad toward the item to be braked.

Re: claim 14. Ward, as modified, describes the invention substantially as set forth above, but does not include the limitation wherein the force sensor is located to receive a reaction force from the eccentric shaft and the eccentric shaft applying the reaction force to the bearing.

Carre et al. teach in figure 1 the use of a force sensor 23 being located to receive a reaction force from a shaft 10,11 driving at least one rolling bearing 14 to force the pistons and the brake pad toward an item 1a to be braked.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned a force sensor such that it received a reaction

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force from the eccentric shaft of Ward, as modified, in view of the teachings of Carre et al., in order to provide a means of detecting the force transmitted by the piston structure on the friction member as taught by Carre et al. in col. 3 lines 15-18.

Allowable Subject Matter

12. Claims 4-6 and 15-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

13. Applicant's arguments filed 6/8/05 and 9/16/05 have been fully considered but they are not persuasive.

Applicant argues that Carre does not utilize its force sensor for an adjustment purpose. Examiner disagrees and directs Applicant's attention to col. 3 lines 14-21 in which it describes force sensor 23 being used to control actuation mechanism 9 in both directions. This language clearly describes an adjusting procedure. The same argument holds for the Ward in view of Carre rejections.

Applicant further argues that the Carre force sensor would not benefit by having the variable resistance taught by Oreper. Examiner disagrees. Oreper teaches a means by which a force sensor may be protected by incorporating variable resistance. Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the force sensor of Carre to have included variable resistance features, as taught by Oreper, to protect the sensor and improve

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overall product reliability. Such a combination is not hindsight, as suggested by Applicant, since Carre includes a force sensor and the prior art teaches a means of protecting a force sensor for reliability purposes. Accordingly, the rejections are maintained.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melody M. Burch whose telephone number is 571-272-7114. The examiner can normally be reached on Monday-Friday (6:30 AM-3:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James McClellan can be reached on 571-272-6786. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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November 15, 2005

Melody M. Burch
11/15/05